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EXAMINER

GUTIERREZ, ANTHONY

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/646,942	Applicant(s) ISUMI ET AL.	
	Examiner ANTHONY GUTIERREZ	Art Unit 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/8/08 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keenan et al. (US 6,584,413 B1) in view of Lundstedt et al. (US 7,194,369 B2).

As to claim 1, Keenan et al. discloses a pass/fail judgment device which takes the form of pass/fail objects as a pass/fail judgment factor, comprising: a discriminant function computing unit, (in the form of a histogram) for computing discriminant functions which give variables used to separate the frequency distributions of pass category and fail category from a plurality of pieces of parameter information which

make pass/fail judgment factors and pass/fail judgment result information thereof (col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance); a statistical parameter computing unit for computing the center of distribution and distribution parameters indicating the breadth of the distribution for said variables with respect to either or both of said pass category and fail category (col. 9, lines 15 and 16, and col. 10, lines 1-16); a threshold determining unit for determining a threshold for providing a pass/fail judgment based on the value of a variable (col. 15, lines 33-45); a parameter information acquiring unit for acquiring a plurality of pieces of parameter information on pass/fail judgment objects (col. 5, lines 55-65) according to data of a normal distribution (col. 13, lines 15-32 and col. 16, lines 15-23); and a pass/fail judging unit for comparing the value of said variable obtained by substituting the parameter information into said discriminant function with said threshold and thereby makes pass/fail judgment (col. 26, line 62-col. 27, line 34).

Keenan et al. discloses the threshold determining unit gives a specific distribution probability weighting based on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts. Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the pass/fail judgment unit has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose that the distribution probability is based on at least one of a rate of flowout in the fail category, which represents a number of pass/fail judgment objects contained in the fail category that are judged as passed, and a rate of overcontrol in the pass category, which represents a number of pass/fail judgment objects contained in the pass category that are judged as failed, relative to said center of distribution and said distribution parameters, nor that the threshold determining unit separates the overcontrol and flowout having the normal distribution.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33). Lundstedt et al. further discloses separating the overcontrol and flowout having the normal (Gaussian) distribution (col. 31, lines 27-30 and col. 31, line 57-col. 32, line 24).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier

compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 2, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 1. In addition, Keenan et al. discloses that the statistical parameter computing unit computes the mean and standard deviation of fail category, and said threshold determining unit takes as said threshold said variable value equivalent to a value which is away from said mean of fail category by a constant multiple of the standard deviation thereof (col. 23, line 59- col. 24, line 9).

As to claim 3, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 2. In addition, Keenan et al. discloses that said statistical parameter computing unit computes the mean and standard deviation of said pass category, and said threshold determining unit judges by what multiple of the standard deviation the threshold determined by said mean and standard deviation of said fail category is away from said mean of said pass category (with respect to Least Squares, and thereby computes a rate of occurrence (with respect to the combination of references) of said overcontrol with that threshold (col. 15, lines 32-49).

As to claim 4, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 1. In addition, Keenan et al. discloses converting specified inspection data obtained as the result of inspecting a plurality of pass/fail judgment objects with a specified inspecting instrument in advance into parameters which represent different pass/fail judgment factors by a plurality of different conversion expressions, and is stored in a specified storage medium (including a hard drive), and a

plurality of pieces of parameter information on pass/fail judgment objects acquired by said parameter information acquiring unit and the results of pass/fail judgment by said pass/fail judging unit are additionally stored in the specified storage medium (col. 6, lines 11-40).

As to claim 5, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 4. In addition, Keenan et al. discloses the judgment device comprises a unit for inputting the results of visual pass/fail judgment on said pass/fail judgment objects, said pass/fail judgment result information indicating the results of said visual pass/fail judgment is correlated with the parameter information on said pass/fail judgment objects, and if the results of pass/fail judgment by said pass/fail judging unit and the results of said visual pass/fail judgment are different from each other, the results of the visual pass/fail judgment are additionally stored as correct judgment results in said specified storage medium (col. 6, lines 11-40).

As to claim 6, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 5. In addition, Keenan et al. discloses the judgment device comprises a unit for inputting the causes for visual pass/fail judgment and the results of the visual pass/fail judgment on said pass/fail judgment objects, either or both of said pass category and fail category are subdivided by cause for the pass/fail judgment and taken as said pass/fail judgment result information, and said discriminant function computing unit computes discriminant functions which give variables which separate the frequency distributions of the subdivided pass category and fail category (col. 6, lines 11-40).

As to claims 7, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 1. In addition, Keenan et al. discloses that computing discriminant functions having as a variable any of a plurality of said parameters, the discriminant function computing unit computes correlation coefficients between the parameters, counts the number of parameters which give a correlation coefficient not less than a predetermined value in said pass category and fail category, disuses parameters having a high count, and repeats this processing to eliminate multicollinearity (col. 12, lines 24-38 and col. 20, line 53- col. 21, line 3).

As to claim 8, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 1. In addition, Keenan et al. discloses in computing discriminant functions having as a variable any of a plurality of said parameters, said discriminant function computing unit disuses parameters in increasing order of priorities given to the parameters in advance, and repeats this processing to eliminate multicollinearity (col. 12, lines 24-38 and col. 20, line 53- col. 21, line 3).

As to claim 9, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 1. In addition, Keenan et al. discloses that the judgment device comprises: an electromagnetic wave applying unit for irradiating pass/fail judgment objects with predetermined electromagnetic waves (col. 1, line 54- col. 2, line 38, where the pass and fail categories are related to the purity of a substance); an electromagnetic wave detecting unit for detecting reflected electromagnetic waves or transmitted electromagnetic waves produced as the result of the application of the electromagnetic waves (col. 3, lines 25-29); and an

electromagnetic wave data generating unit for generating electromagnetic wave data from the detection values of reflected electromagnetic waves or transmitted electromagnetic waves detected by the electromagnetic wave detecting unit (col. 5, lines 55-65), and said discriminant function computing unit and said parameter information acquiring unit substitute said electromagnetic wave data into a plurality of different conversion expressions to compute values corresponding to the forms of pass/fail judgment objects, and take the computed values as a plurality of pieces of said parameter information (col. 26, line 62-col. 27, line 34)

As to claim 10, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 9. In addition, Keenan et al. discloses that the judgment device comprises: a positional information acquiring unit for acquiring positional information on pass/fail judgment objects waves; and an arrangement analyzing unit for, when electromagnetic waves reflected by a plurality of pass/fail judgment objects more than once are detected by said electromagnetic wave detecting unit (col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance), grasping the arrangement of the pass/fail judgment objects from said positional information, and said discriminant function computing unit disuses or gives lower priorities to said parameters to which said electromagnetic waves reflected more than once greatly contribute. (col. 26, line 62-col. 27, line 34).

As to claim 11, Keenan et al. discloses a pass/fail judgment method comprising: computing discriminant functions (in the form of a histogram) which give variables which separate the frequency distributions of pass category and fail category from a plurality

of pieces of parameter information which make pass/fail judgment factors and pass/fail judgment result information thereof (col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance); computing a center of distribution and distribution parameters indicating the breadth of the distribution for said variables with respect to either or both of said pass category and fail category (col. 9, lines 15 and 16, and col. 10, lines 1-16); determining a threshold for providing a pass/fail judgment based on the value of a variable (col. 15, lines 33-45); acquiring a plurality of pieces of parameter information on pass/fail judgment objects (col. 5, lines 55-65) according to data of a normal distribution (col. 13, lines 15-32 and col. 16, lines 15-23); and comparing the value variables obtained by substituting the parameter information into said discriminant function with said threshold and displaying a pass/fail judgment for the one or more pass/fail judgment objects based on the comparing step(col. 26, line 62-col. 27, line 34).

Keenan et al. discloses a threshold determining unit that gives a specific distribution probability weighting based on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts. Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the pass/fail judgment has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose that the distribution probability is based on at least one of a rate of flowout in the fail category, which represents a number of pass/fail judgment objects contained in the fail category that are judged as passed, and a rate of overcontrol in the pass category, which represents a number of pass/fail judgment objects contained in the pass category that are judged as failed, relative to said center of distribution and said distribution parameters nor that the rate of overcontrol and flowout have the normal distribution.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33). Lundstedt et al. further discloses that the rate of overcontrol and flowout have the normal (Gaussian) distribution (col. 31, lines 27-30 and col. 31, line 57-col. 32, line 24).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier

compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 12, Keenan et al. discloses a pass/fail judgment method taking the form of pass/fail objects as a pass/fail judgment factor comprising: a discriminant function computing step, (in the form of use of a histogram) in which discriminant functions which give variables which separate the frequency distributions of pass category and fail category from a plurality of pieces of parameter information which make pass/fail judgment factors and pass/fail judgment result information thereof (col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance); a statistical parameter computing step in which a center of distribution and distribution parameters indicating a breadth of the distribution for said variables are computed with respect to either or both of said pass category and fail category (col. 9, lines 15 and 16, and col. 10, lines 1-16); a threshold determining step for determining a threshold for providing a pass/fail judgment based on the value of a variable (col. 15, lines 33-45); a parameter information acquiring step in which a plurality of pieces of said parameter information on one or more pass/fail judgment objects are acquired (col. 5, lines 55-65) according to data of a normal distribution (col. 13, lines 15-32 and col. 16, lines 15-23); and a pass/fail judging step in which the value of variables obtained by substituting the parameter information into said discriminant function are compared with said threshold and thereby makes pass/fail judgment for the one or more pass/fail judgment objects is displayed based on the comparison with said threshold (col. 26, line 62-col. 27, line 34).

Keenan et al. discloses a threshold determining unit that gives a specific distribution probability weighting based on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts. Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the pass/fail judgment step has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose that the distribution probability is based on at least one of a rate of flowout in the fail category, which represents a number of pass/fail judgment objects contained in the fail category that are judged as passed, and a rate of overcontrol in the pass category, which represents a number of pass/fail judgment objects contained in the pass category that are judged as failed, relative to said center of distribution and said distribution parameters nor that the rate of overcontrol and flowout have the normal distribution.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout

(which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33). Lundstedt et al. further discloses that the rate of overcontrol and flowout have the normal (Gaussian) distribution (col. 31, lines 27-30 and col. 31, line 57-col. 32, line 24).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 13, Keenan et al. discloses a multivariate statistics analyzer which is capable of communication of data with the outside through a communication interface and executes a multivariate analysis program under the control of a predetermined operating system, wherein said multivariate statistics analyzer comprises a hard disk drive which is capable of accumulating the multivariate analysis program and transmitting, receiving, and accumulating data (col. 6, lines 11-40), said multivariate analysis program comprises modules corresponding to a mode classifying portion which includes parameter value data consisting of parameter values which are correlated with at least pass/fail judgment result data of one or more pass/fail judgment objects when the data is externally acquired through said communication interface and stored in said hard disk drive and are actually computed with respect to each component, and subdivides categories based on the accumulated data(col. 5, lines 55-65 and col. 26,

line 62-col. 27, line 34); a discriminant function computing portion (in the form of a histogram) which eliminates multicollinearity and further computes discriminant functions based on said parameter value data(col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance); a statistical parameter computing portion which computes a center of distribution parameters and including a breadth of a distribution for variables with respect to either or both of a pass category and a fail category, and the mean and standard deviation in the frequency distributions of said pass category and said fail category with respect to said discriminant functions (col. 9, lines 15 and 16, and col. 10, lines 1-16); and a threshold determining portion for determining a threshold for providing a pass/fail judgment based on the value of a variable defined by a specific distribution probability (col. 15, lines 33-45), the threshold determining portion further performs the operations of acquiring said discriminant function data, said parameter value data and pass/fail judgment result data (col. 5, lines 55-65); generating a histogram corresponding to a pass/fail judgment result on a category-by-category basis (col. 2, lines 18- 38), computing a mean and a standard deviation of each category in the generated histograms, and determining the threshold of a discriminant function corresponding to a specified rate and a pass/fail judgment display portion configured to display a pass/fail judgment for the one or more pass/fail judgment objects based on the threshold determined by the threshold determining portion(col. 26, line 61-col. 27, line 34).

Keenan et al. discloses the threshold determining unit gives a specific distribution probability weighting based on said center of distribution and distribution parameters

(col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts. Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. does not specifically disclose that the distribution probability is based on at least one of a rate of flowout in the fail category which represents a number of pass/fail judgment objects that should be classified in the fail category, but are actually judged as being classified in the pass category, and a rate of overcontrol in the pass category, which represents a number of pass/fail judgment objects contained in the pass category that are judged as failed, relative to said center of distribution and said distribution parameters.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 14, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 13. In addition, Keenan et al. discloses that said threshold determining portion is externally fed with said rate of flowout and determines the threshold of said discriminant function so that the inputted rate of flowout will be obtained (col. 15, lines 32-49).

As to claim 15, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 14. In addition, Keenan et al. discloses said threshold determining portion determines as a threshold the range from the mean to four times the standard deviation which is considered to be the range corresponding to said rate of flowout (col. 15, lines 32-49).

As to claim 16, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 13. In addition, Keenan et al. discloses said threshold determining portion judges the suitability of said determined threshold of discriminant function based on the mean and standard deviation computed in a pass category and said specified rate of overcontrol which is set for said pass category and indicates the range in which non-defective units are judged as defective units (col. 15, lines 32-49).

As to claim 17, Keenan et al. and Lundstedt et al. disclose everything claimed as applied above with respect to claim 16. In addition, Keenan et al. discloses aid threshold determining portion judges the suitability of said threshold depending on whether the threshold falls in the range from the mean to nine times the standard deviation which is considered to be the range corresponding to said rate of overcontrol) (col. 15, lines 32-49).

As to claim 18, Keenan et al. discloses a quality control apparatus which takes the form of pass/fail objects as a pass/fail judgment factor comprising (See Fig. 10 and related discussion beginning col. 19, line 52): a statistical computing unit configured to receive object data representing one or more characteristics of an object and compute at least one of a first probability that the object will be classified in a first category and a second probability that the object will be classified in a second category based on the received object data (28) (See also col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance and in which a discriminate function is disclosed as calculated to discriminate between one or more objects classified in the first category from one or more objects classified in the second category); an input unit (30); a calculation unit (34); a judging unit configured to determine whether one or more objects should be classified in one of the first and second categories based on the discriminate function calculated by the calculation unit (43); and a communication unit configured to communicate whether the object is classified in one of the first and second categories based on the determination of the judging unit (49).

Keenan et al. discloses the threshold determining unit gives a specific distribution probability weighting based on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts. Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the judging unit has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose for the input or calculation units that the discriminant function is calculated based on the at least one of the rate of flowout in the second category which represents a number of objects that should be classified in the second category that are actually judged as being classified in the first category, and the rate of overcontrol in the first category which represents a number of objects that should be classified in the first category that are actually judged as being classified in the second category, received by the input unit and based on at least one of the first and second probabilities computed by the statistical computing unit.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by

incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 19, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses that the one or more characteristics of the object include label data (atomic structure) and form data (molecular structure) (col. 2, lines 39-41).

As to claim 20, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses that the first category comprises a pass category, which represents a group of one or more objects that satisfy a predetermined criteria, and the second category comprises a fail category, which represents another group of one or more objects that do not satisfy the predetermined criteria (col. 15, lines 33-48).

As to claim 21, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses that the first category comprises a group of one or more objects that have a higher degree of

quality than another group of one or more objects in the second category (col. 15, lines 33-45).

As to claim 22, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses that comprising a detector (implied by the S/N criteria) configured to detect physical characteristics of the object and communicate the detected physical characteristics of the object to the statistical computing unit (col. 15, lines 33-45).

As to claim 23, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 22, and furthermore Keenan et al. discloses that the detected physical characteristics of the object include an orientation of one component of the object relative to another component of the object (col. 21, lines 4-20).

As to claim 24, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 22, and furthermore Keenan et al. implies that the detector comprises a laser inspecting instrument by teaching that the method is implemented using spectral analysis in any available electromagnetic range including the use of photon emission of radiation in the ultraviolet, infrared and X-ray wavelengths (col. 3, lines 25-29).

As to claim 25, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses (with respect to the combination of references) that the at least one of the rate of flowout and the rate of overcontrol comprises a visual observation by an operator of an actual

orientation of one component of the object relative to another component of the object (col. 24, lines 40-58).

As to claim 26, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 25, and furthermore Keenan et al. discloses that the visual observation by the operator occurs after the statistical computing unit has computed at least one of the first and second probabilities (col. 24, lines 59-64).

As to claim 27, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses that the discriminate function is different from a midpoint between a mean value of a first probability distribution and a mean value of a second probability distribution (col. 9, line 45 to col. 10, line 34, where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts).

As to claim 28, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 18, and furthermore Keenan et al. discloses that the communication unit comprises a display unit arranged to provide a visual representation of whether the object is classified in one of the first and second categories based on the determination of the judging unit (col. 20, lines 29-35 regarding element 49).

As to claim 29, Keenan et al. discloses a computer-implemented quality control method taking the form of pass/fail objects as a pass/fail judgment factor (See Fig. 10 and related discussion beginning col. 19, line 52) comprising: receiving object data representing one or more physical characteristics of an object; computing a first probability distribution, which represents a probability that one or more objects should be classified in a first category, based on the received object data and computing a second probability distribution, which represents a probability that one or more objects should be classified in a second category, based on the received object data (discussion related to element 28) (See also col. 1, line 54-col. 2, line 38, where the pass and fail categories are related to the purity of a substance and in which a discriminate function is disclosed as calculated to discriminate between one or more objects classified in the first category from one or more objects classified in the second category); determining whether one or more objects should be classified in one of the first and second categories based on the discriminate function calculated by the calculation unit (discussion related to element 43); and communicating the determination of whether the one or more objects are classified in one of the first and second categories to an operator (discussion related to elements 49 and 51).

Keenan et al. discloses calculating a discriminate function to discriminate between one or more objects that should be classified in the first category from one or more objects that should be classified in the second category based on the first and second probability distributions computed by the statistical computing unit by disclosing that a threshold determining unit gives a specific distribution probability weighting based

on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts. Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the object classification determination has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose receiving an rate of flowout in the second category, which represents a number of objects that should be classified in the second category, but are actually judged as being classified in the first category; receiving an rate of overcontrol in the first category representing a number of objects that should be classified in the first category, but are actually judged as being classified in the second category to base the calculation of the discriminant function nor that the rate of overcontrol and flowout have the normal distribution.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive

observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33). Lundstedt et al. further discloses that the rate of overcontrol and flowout have the normal (Gaussian) distribution (col. 31, lines 27-30 and col. 31, line 57-col. 32, line 24).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 30, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 29, and furthermore Keenan et al. discloses that the one or more physical characteristics of the object include label data (atomic structure) and form data (molecular structure) representing one or more structural features of the object (col. 2, lines 39-41).

As to claim 31, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 29, and furthermore Keenan et al. discloses that the first category comprises a pass category, which represents a group of one or more objects that satisfy a predetermined criteria, and the second category comprises a fail category, which represents another group of one or more objects that do not satisfy the predetermined criteria (col. 15, lines 33-48).

As to claim 32, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 29, and furthermore Keenan et al. discloses that

the first category comprises a group of one or more objects that have a higher degree of quality than another group of one or more objects of the second category (col. 15, lines 33-45).

As to claim 33, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 29, and furthermore Keenan et al. discloses detecting physical characteristics of the object and communicating the detected physical characteristics of the object to the statistical computing unit (col. 15, lines 33-45).

As to claim 34, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 33, and furthermore Keenan et al. discloses that the detected physical characteristics of the object include an orientation of one component of the object relative to another component of the object (col. 21, lines 4-20).

As to claim 35, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 29, and furthermore Keenan et al. discloses (with respect to the combination of references) that the received rate of flowout and the received rate of overcontrol comprise a visual observation by the operator of an actual orientation of one component of the object relative to another component of the object (col. 24, lines 40-58).

As to claim 36, Keenan et al. and Lundstedt et al. disclose everything as addressed above with respect to claim 29, and furthermore Keenan et al. discloses that the discriminate function is different from a midpoint between a mean value of the first probability distribution and a mean value of the second probability distribution (col. 9, line 45 to col. 10, line 34, where the Poisson probability distribution is determined based

on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts).

As to claim 37, Keenan et al. discloses a computer-implemented quality control apparatus (See Fig. 10 and related discussion beginning col. 19, line 52) comprising: a detector (implied by the S/N criteria) configured to detect physical characteristics of an object and generate object data representing the detected physical characteristics of the object (col. 15, lines 33-45); a statistical computing unit configured to compute a non-defective object probability distribution representing a probability that one or more objects should be classified in a non-defective category based on the object data generated by the detector and compute a defective object probability distribution representing a probability that one or more objects should be classified in a defective category based on the object data generated by the detector (28) (See also col. 1, line 54-col. 2, line 38, where the defectiveness of categories is related to the purity of a substance and in which a discriminate function is disclosed as calculated to discriminate between one or more objects classified in the first category from one or more objects classified in the second category), classify the one or more objects as being in the non-defective category based on a match between a first pattern of object data and the computed non-defective object probability distribution, and classify the one or more objects as being in the defective category based on a match between a second pattern of object data and the computed defective object probability distribution (Keenan et al.

discloses calculating a discriminate function to discriminate between one or more objects that should be classified in the first category from one or more objects that should be classified in the second category based on the first and second probability distributions computed by the statistical computing unit by disclosing that a threshold determining unit gives a specific distribution probability weighting based on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts); an input unit (30) including a visual observation by an operator of an actual orientation of one component of the object relative to another component of the object (col. 21, lines 4-20 and col. 24, lines 40-58); a calculation unit configured to calculate a discriminate function to discriminate between defective and non-defective objects based on the non-defective category and defective object probability distributions computed by the statistical computing unit and based on the feedback data received by the input unit (34), the discriminate function being different from a midpoint between a mean value of the first probability distribution and a mean value of the second probability distribution (col. 9, line 45 to col. 10, line 34); a judging unit configured to determine whether the one or more objects should be classified in one of the defective or non-defective categories based on the discriminate function calculated by the calculation unit (43); and a display unit configured to display whether

the one or more objects are classified in one of the defective or non-defective categories based on the determination of the judging unit (49). Keenan et al. further addresses that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the judging unit has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose the units configured to receive a rate of flowout in the defective category, which represents a number of objects that should be classified in the defective category by the statistical computing unit, but are actually judged as being classified in the non-defective category, and a rate of overcontrol in the non-defective category, which represents a number of objects that should be classified in the non-defective category by the statistical computing unit, but are actually judged as being classified in the defective category, the received rate of flowout and the received rate of overcontrol nor that the rate of overcontrol and flowout have the normal distribution.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned

in the training set (col. 10, lines 30-33). Lundstedt et al. further discloses that the rate of overcontrol and flowout have the normal (Gaussian) distribution (col. 31, lines 27-30 and col. 31, line 57-col. 32, line 24).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

As to claim 38, Keenan et al. discloses a computer-implemented quality control method comprising (See Fig. 10 and related discussion beginning col. 19, line 52): detecting physical characteristics of an object and generating object data representing the detected physical characteristics of the object (col. 15, lines 33-45); computing a non-defective object probability distribution representing a probability that one or more objects should be classified in a non-defective category based on the generated object data (discussion of 28) (See also col. 1, line 54-col. 2, line 38, where the defectiveness of categories is related to the purity of a substance and in which a discriminate function is disclosed as calculated to discriminate between one or more objects classified in the first category from one or more objects classified in the second category); computing a defective object probability distribution representing a probability that one or more objects should be classified in a defective category based on the generated object data; classifying the one or more objects as being in the non-defective category based on a match between a first pattern of object data and the computed non-defective object probability distribution; classifying the one or more objects as being in the defective

category based on a match between a second pattern of object data and the computed defective object probability distribution (Keenan et al. discloses calculating a discriminate function to discriminate between one or more objects that should be classified in the first category from one or more objects that should be classified in the second category based on the first and second probability distributions computed by the statistical computing unit by disclosing that a threshold determining unit gives a specific distribution probability weighting based on said center of distribution and distribution parameters (col. 9, line 45 to col. 10, line 34) where the Poisson probability distribution is determined based on a standard deviation equal to the square root of a mean value in order to provide a weighting transformation that can detect contaminants, trace elements, or subtle gradients in the composition that otherwise would not have been detected, effectively allowing for less than pure amounts to be passed as pure amounts); calculating a discriminate function to discriminate between one or more objects classified in the non-defective category from one or more objects classified in the defective category, the discriminate function being different from a midpoint between a mean value of the computed non-defective object probability distribution and a mean value of the computed defective object probability distribution (col. 9, line 45 to col. 10, line 34); determining whether one or more objects should be classified in one of the defective or non-defective categories based on the calculated discriminate function (discussion of 43); and displaying an image that illustrates whether the one or more objects are classified in one of the defective or non-defective categories based on the determining step (discussion of 49). Keenan et al. further addresses including a visual

observation by an operator of an actual orientation of one component of the object relative to another component of the object (col. 21, lines 4-20 and col. 24, lines 40-58) and that one aspect of weighting that as important is the treatment of outliers (col. 10, lines 38-46).

Keenan et al. further discloses that the judging unit has a standard deviation which is based on the normal distribution (col. 12, lines 39-45 and col. 23, lines 59-col. 24, line 21).

Keenan et al. does not specifically disclose receiving an rate of flowout in the defective category, which represents a number of objects that should be classified in the defective category, but are actually judged as being classified in the non-defective category; and receiving an rate of overcontrol in the non-defective category, which represents a number of objects that should be classified in the non-defective category, but are actually judged as being classified in the defective category nor that the rate of overcontrol and flowout have the normal distribution.

Lundstedt et al., however, discloses processing by using multivariate calibration models which can compensate for variations in material characteristics (Abstract) by incorporating specific types of outlier information (col. 10, lines 1-45) including flowout (which the Examiner maintains is equivalent to the outlier being a false positive observation (col. 10, line 8) and overcontrol which the Examiner maintains is a valid measurement which falls outside the range of primary or secondary variable spanned in the training set (col. 10, lines 30-33). Lundstedt et al. further discloses that the rate of

overcontrol and flowout have the normal (Gaussian) distribution (col. 31, lines 27-30 and col. 31, line 57-col. 32, line 24).

It therefore would have been obvious to one of ordinary skill in the art at the time of invention to, incorporate flowout and overcontrol conditions as related to outlier compensation, as taught by Lundstedt et al., in the outlier based weighting of Keenan et al. to more accurately judge the purity of the substance.

Response to Arguments

4. Applicant's arguments with respect to claims 1-38 have been considered but are moot in view of the new ground(s) of rejection.

The Examiner disagrees with Applicants allegations regarding the new limitations provided by the current amendment and maintains that all claimed limitations are disclosed or rendered obvious by the prior art of record with respect to the broadest reasonable interpretation of the claims.

The Examiner has adjusted his rejection to address the newly presented claim limitations. Therefore, the Examiner maintains that while Applicant's arguments are moot in view of the new ground(s) of rejection, where the new grounds are due to an amendment by the Applicant, the Examiner further maintains that Applicant's arguments are not persuasive.

The Applicant has argued:

"For example, as recited in the present claims, overcontrol and flowout are judged based on the data of a normal distribution, and the overcontrol and flowout are separated having the normal distribution."

In response to this argument, the Examiner maintains that this specific language is not included in the claims.

For example, the claim language fails to include that **overcontrol and flowout are judged based on the data of the normal distribution**, but rather that the **judging unit has a standard deviation based on the normal distribution**.

Additionally, the claim language fails to included that **overcontrol and flowout are separated having the normal distribution** but rather that the unit **separates the overcontrol and flowout having the normal distribution**. The potential difference in interpretation lies in that the **separation** itself need not be related to the normal distribution as claimed, but the argument seems to suggest this is the case. The actual claim interpretation only requires that the overcontrol and flowout have the normal distribution and that they are separated (but not necessarily based on the normal distribution). The Examiner has cited sections of the prior art to address the limitations as they are specifically recited in the broadest reasonable interpretation of the claims regarding the amended limitations.

The Applicant has argued:

“The pass/fail judgment unit [step] has a standard deviation which is based on the normal distribution. In contrast, Keenan performs an analysis of a chemical microanalytical characterization of a sample (col. 1, line 55), using Poisson statistics for controlling the noise effects (col. 10, line 2). “

In response to this argument, the Examiner maintains that Keenan et al. does include a pass/fail judgment unit/step that includes a standard deviation as it relates to the sensitivity threshold for determining the purity of spectral components to be maintained newly cited by the Examiner to address this particular limitation.

The Applicant has argued:

“Lundstedt discloses a process for analyzing materials (col. 1, line 27), and does not mention controlling either overcontrol or flowout. Nor does Lundstedt provide any of the teachings missing from Keenan. “Moreover, although Lundstedt discloses an "outlier," or "invalid predicted value (col. 10, lines 3-5), this is not the same as measuring flowout and overcontrol, as those terms are used in the claims. “

In response to this argument, the Examiner maintains that Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that

the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

The Examiner has addressed an interpretation of flowout and overcontrol as taught by Lundstedt consistent with the broadest reasonable interpretation of the claims. The Applicant has not addressed this interpretation, but rather relies on a different interpretation for this argument.

The Applicant has argued:

“At least because Keenan and Lundstedt, viewed alone or in combination, fail to disclose or suggest each of the elements recited in the claims, combination of these references fails to create a *prima facie* case of obviousness under 35 U.S.C. § 103(a), and claims 1-38 are patentable over Keenan and Lundstedt. “

In response to this argument, the Examiner maintains this argument relies on the position that all elements recited in the claims are not disclosed by Keenan and Lundstedt. The Examiner maintains that all elements recited in the claims are disclosed by Keenan and Lundstedt as addressed above, and therefore this argument is not persuasive.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Gutierrez whose telephone number is (571) 272-2215. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571) 272-7925. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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